Superior Broadcast LLC

SBFM150-SS

User Manuals

Superior Broadcast LLC

18208 Preston Rd. Suite D9-297, Dallas, TX 75252. www.sbp-tv.com

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Superior Broadcast
18208 Preston Rd, Suite D9-297, Dallas, TX 75252
Tel: 972-473-2577 | Email: jjsbp@msn.com
www.sbp-tv.com

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Superior Broadcast

Jimmie Joynt
Tel: 972-473-2577 | Email: jjsbp@msn.com

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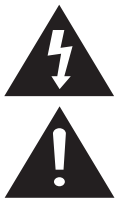
IMPORTANT



The lightning flash with arrowhead, within a triangle, is intended to alert the user of the presence of dangerous voltage that may constitute a risk of electric shock.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.

1. Preliminary Instructions

• General foreword The equipment in object is to considering for uses, installation and maintenance from “trained” or “qualified” staff, they conscious of the risks connected to operate on electronic and electrical circuits electrical.

The “trained” definition means staff with technical knowledge about the use of the equipment and with responsibility regarding the own safety and the other not qualified staff safety place under his directed surveillance in case of works on the equipment. The “qualified” definition means staff with instruction and experience about the use of the equipment and with responsibility regarding the own safety and the other not qualified staff safety place under his directed surveillance in case of works on the equipment.

WARNING: The machine can be equipped with an ON/OFF switch which could not remove completely voltages inside the machine. It is necessary to have disconnected the feeding cord, or to have switched off the control panel, before to execute technical operations, making sure himself that the safety connection to ground is connected. The technical interventions that expect the equipment inspection with circuits under voltage must be carry out from trained and qualified staff in presence of a second trained person that it is ready to intervene removing voltage in case of need.

Superior Broadcast doesn’t assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

WARNING: The equipment is not water resistant and an infiltration could seriously compromise its correct operation. In order to prevent fires or electric shocks, do not expose the equipment to rain, infiltrations or humidity.

Please observe all local codes and fire protection standards during installation and use of this unit.

WARNING: The equipment has to its inside exposed parts to risk of electric shock, always disconnect power before opening covers or removing any part of this unit.

Fissures and holes are supplied for the ventilation in order to assure a reliable efficacy of the product that for protect itself from excessive heating, these fissures do not have to be obstructed or to be covered. The fissures doesn’t be obstructed in no case. The product must not be incorporated in a rack, unless it is supplied with a suitable ventilation or that the manufacturer’s instructions are been followed.

WIRING: This equipment can irradiate radio frequency energyand if it’s not installed following the instructions contained in the manual and local regulations it could generate interferences in radio communications

WIRING: This device has a connection to ground on the power cord and on the chassis. Check that they are correctly connected.

Operate with this device in a residential ambient can cause radio disturbs; in this case, it can be demanded to the user to take adequate measures. Specifications and informations contained in this manual are furnished for information only, and are subject to change at any time without notice, and should not be construed as a commitment by **Superior Broadcast.**

The Superior Broadcast assumes no responsability or liability for any errors or inaccuracies that may appear in this manual, including the products and software described in it;and it reserves the right to modify the design and/or the technical specifications of the product and this manual without notice.

• Warning regarding the use designated and the use limitations of the product.

This product is an transmitter radio indicated for the audio broadcasting service in frequency modulation. It uses working frequencies that are not harmonized in the states of designated user. The user of this product must obtain from the Authority for spectrum management in the state of designated user the appropriate authorization to use the radio spectrum, before putting in exercise this equipment. The working frequency, the transmitter power, let alone other specifications of the transmission system are subject to limitation and definited in the authorization obtained.

2. Warranty

Superior Broadcast guarantees absence of manufacturing defect and the good operation for the products, within the provided terms and conditions. Please read the terms carefully, because the purchase of the product or acceptance of order confirmation, constitutes acceptance of the terms and conditions. For the last legal terms and conditions, please visit our web site www.sbp-tv.com) wich may also be changed, removed or updated for any reason without prior notice. Warranty will be void in cases of opened products, physical damage, misuse, modification, repair by unauthorised persons, carelessness and using the product for other purpose than its intended use. In case of defect, proceed like described in the following:

1. Contact the dealer or distributor where you purchased the unit. Describe the problem and, so that a possible easy solution can be detected.

Dealers and Distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installing errors are discovered by dealers.

2. If your dealer cannot help you, contact **Superior Broadcast** and explain the problem. If it is decided to return the unit to the factory, **Superior Broadcast** will mail you a regular authorization with all the necessary instructions to send back the goods;

3. When you receive the authorization, you can return the unit. Pack it carefully for the shipment, preferably using the original packing and seal the package perfectly. The customer always assumes the risks of loss (i.e.,

Superior Broadcast. is never responsible for damage or loss), until the package reaches R.V.R. premises. For this reason, we suggest you to insure the goods for the whole value. Shipment must be effected C.I.F. (PREPAID) to the address specified by Superior Broadcast's service manager on the authorization

DO NOT RETURN UNITS WITHOUT OUR AUTHORIZATION AS THEY WILL BE REFUSED

4 Be sure to enclose a written technical report where mention all the problems found and a copy of your original invoice establishing the starting date of the warranty.

Replacement and warranty parts may be ordered from the following address. Be sure to include the equipment model and serial number as well as part description and part number.

Superior Broadcast
18208 Preston Rd, Suite D9-297
Dallas, TX 75252
Tel: 972-473-2577

3. First Aid

The personnel employed in the installation, use and maintenance of the device, shall be familiar with theory and practice of first aid.

3.1 Treatment of electrical shocks

3.1.1 If the victim is not responsive

Follow the A-B-C's of basic life support.

- Place victim flat on his backon a hard surface.
- Open airway: lift up neck, push forehead back

(Figure 1).

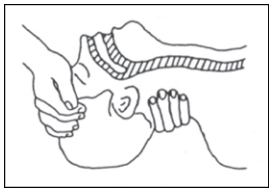


Figure 1

- clear out mouth if necessary and observe for breathing
- if not breathing, begin artificial breathing (Figure 2): tilt head, pinch nostrils, make airtight seal, four quick full breaths

Remember mouth to mouth resuscitation must be commenced as soon as possible.

Figure 2

- Check carotid pulse (Figure 3); if pulse is absent, begin artificial circulation (Figure 4) depressing sternum (Figure 5).

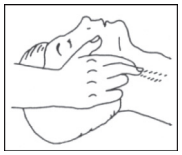


Figure 3

Figure 4

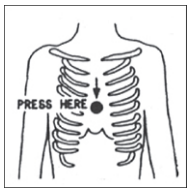


Figure 5

- In case of only one rescuer, 15 compressions alternated to two breaths.
- If there are two rescuers, the rythm shall be of one brath each 5 compressions.
- Do not interrupt the rythm of compressions when the second person is giving breath.
- Call for medical assistance as soon as possible.

3.1.2 If victim is responsive

- Keep them warm.
- Keep them as quiet as possible.
- Loosen their clothing (a reclining position is recommended).
- Call for medical help as soon as possible.

3.2 Treatment of electrical Burns

3.2.1 Extensive burned and broken skin

- Cover area with clean sheet or cloth.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated.

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold).

Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes.

Discontinue fluid if vomiting occurs.

DO NOT give alcohol.

3.2.2 Less severe burns

- Apply cool (not ice cold) compresses using the cleansed available cloth article.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
- Apply clean dry dressing if necessary.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated.

4. General Description

The **TEX30/50/100/150/300/502/702LCD**, manufactured by **R.V.R. Elettronica SpA**, are **exciters for** Frequency Modulated **audio broadcasting** in a frequency modulation able to transmit in the band between 87.5 and 108 MHz, in step of 10 KHz, with an RF output power adjustable up to a maximum of 30, 50, 100, 150, 300, 500 and 700 W respectively into a 50 Ohm standard load.

The **TEX30/50/100/150/300/502/702LCD** are designed to being contained into a 19" rack box of 2HE.

4.1 Unpacking

The package contains:

- 1 **TEX30LCD, TEX50LCD, TEX100LCD, TEX150LCD, TE300LCD, TEX502LCD** or **TEX702LCD**
- 1 User Manual
- 1 Mains power cables

The following accessories are also available from Your R.V.R. Dealer:

- **Accessories, spare parts and cables**

4.2 Features

These exciters contain a low-pass filter that reduces the harmonic emission to provided for by international standards (CCIR, FCC or ETSI) and can be connected directly to the antenna.

Two major features of **TEX30/50/100/150/300/502/702LCD** are compact design and user-friendliness. Design is based on a modular concept: the different functions are performed by modules that, for the most part, are connected through male and facilitates maintenance and module replacement.

The RF power section of the **TEX30LCD** features a MOSFET module delivering up to 30W output power, the **TEX50/100/150LCD** features a MOSFET module delivering up to 150W output power, the **TEX300LCD** features a MOSFET module delivering up to 300W output power, whereas the **TEX502LCD** features two MOSFET modules with up to 350 W output power each; the **TEX702LCD** features a MOSFET module delivering up to 800W output power

Operating frequency stability is ensured by a temperature-compensated reference oscillator and is maintained by a PLL (Phase Locked Loop) system. The exciters will go into frequency lock within 30 seconds after power-on.

The **TEX30/50/100/150/300/502/702LCD** can operate throughout the frequency bank with no need for calibration or set-up.

An LCD on the front panel and a push-button board provide for user interfacing with the microprocessor control system, which offers the following features:

- Output power setup.
- Operating frequency setup.
- Power output enable/disable.
- Power Good feature (User-selectable output power alarm threshold).
- Measurement and display of transmitter operating parameters.
- Communication with external devices such as programming or telemetry systems via RS232 serial interface or I^2C.

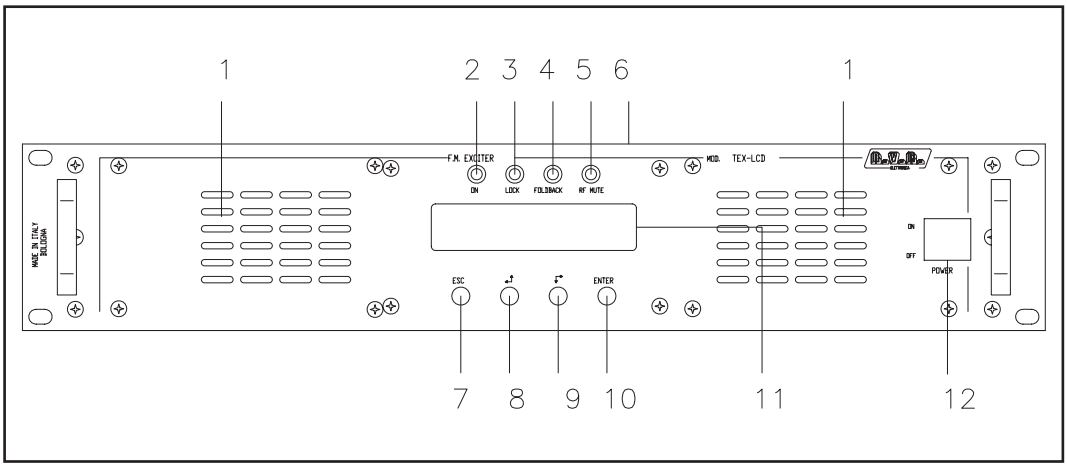
Four LEDs on the front panel provide the following status indications: **ON**, **LOCK**, **FOLDBACK** and **RF MUTE**.

The exciters have an input for the external 24 Vcc supply. This auxiliary supply source, that can be realized by the user with the help of rescue batteries, is automatically used in case of AC voltage absence.

The exciter management firmware is based on a menu system. User has four navigation buttons available to browse submenus: **ESC** , , , ed **ENTER**.

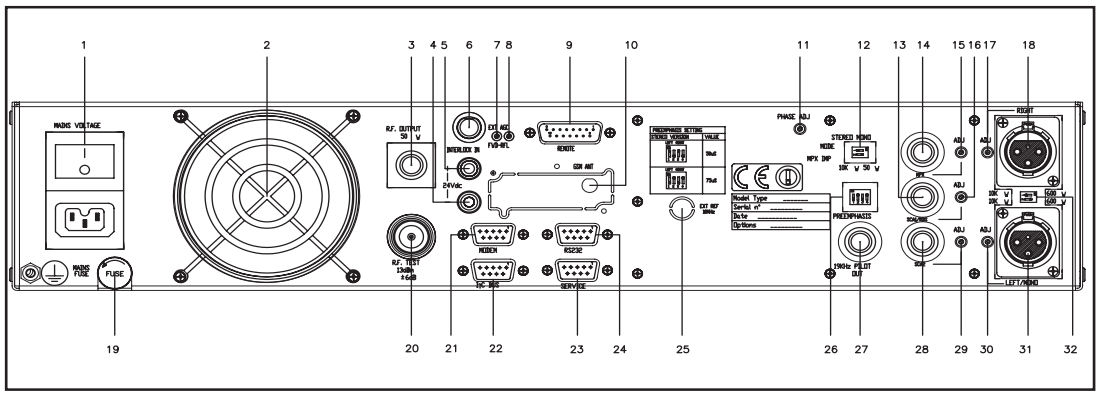
The rear panel features the mains input connectors, as well as audio input connectors and RF output connector, telemetry connector, protection fuses and two inputs for signals modulated onto subcarriers by suitable external coders, such as RDS (Radio Data System) signals commonly used in Europe.

4.3 Frontal Panel Description



[1]	AIR FLOW	Air flow for the forced ventilation.
[2]	ON	Green LED, lit when the exciter is working.
[3]	LOCK	Green led, lit when the PLL is locked on the working frequency.
[4]	FOLDBACK	Yellow LED, lit when the foldback function is operating (automatic reduction of the delivered RF power).
[5]	R.F. MUTE	Yellow LED, lit when the exciter's power output is inhibited by an external interlock command.
[6]	CONTRAST	Display contrast adjusting trimmer (on the top of the equipment).
[7]	ESC	Push button to exit from a menu.
[8]		Push button to move in the menu system and to modify the parameters.
[9]		Push button to move in the menu system and to modify the parameters.
[10]	ENTER	Push button to confirm a parameter and to enter in a menu.
[11]	DISPLAY	Liquid crystals display.
[12]	POWER	ON/OFF switch.

4.4 Rear Panel Description



[1] PLUG — VDE plug for mains supply.

[2] VENTOLA — Fan for the forced ventilation of the exciter.

[3] R.F. OUTPUT — RF output connector, N-type, 50Ω.

[4] 24 VDC IN- — External 24Vdc supply input. Negative (black). Only for TEX30/50/100/150LCD.

[5] 24 VDC IN- — External 24Vdc supply input. Positive (red). Only for TEX30/50/100/150LCD.

[6] INTERLOCK OUT — Connettore BNC di interlock in uscita: quando l'eccitatore entra in modalità stand-by, il conduttore centrale, normalmente flottante, viene posto a massa

[7] FWD EXT. AGC — Trimmer for the control of the delivered power in function of the FWD fold input.

[8] RFL EXT. AGC — Trimmer for the control of the delivered power in function of the RFL fold input.

[9] REMOTE — DB15 connector for telemetry of the machine.

[10] GSM ANT — Reserved for Future Uses - SMA connector for GSM Antenna.

[11] PHASE ADJ — Pilot tone phase adjustment trimmer.

[12] MODE/MPX IMP — Dip-switch to set the operation mode (STEREO or MONO) and the MPX input impedance, 50Ω or 10kΩ.

[13] SCA/RDS — BNC connector, SCA/RDS unbalanced input.

[14] MPX — BNC connector, MPX unbalanced input.

[15] MPX ADJ — Adjustment trimmer for MPX input.

[16] SCA/RDS ADJ — Adjustment trimmer for SCA/RDS input.

[17] RIGHT ADJ — Adjustment trimmer for the Right channel input.

[18] RIGHT — XLR connector, balanced Right channel input.

[19] FUSE BLOCK — Fuse carrier.Use a screwdriver to access the fuse.

[20] R.F. TEST — RF test output, approx. 13 dBm wrt the RF output power level. Not suitable for spectral analysis.

[21] MODEM — DB9 connector connected to GSM modem (only with telemetry option).

[22] I^2C BUS — Normally not used, or used for customized functions (only with telemetry option).

[23] RS232 — DB9 connector for direct serial communication or modem (only with telemetry option).

[24] SERVICE — DB9 connector for interconnection with other devices and for factory parameters programming (only for factory programming).

[25] EXT REF 10MHz — Fine regulation trimmer for frequency transmission. Optionally, Sync signal input BNC connector for external devices.

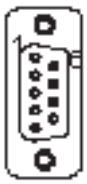
[26] PREEMPHASIS — Dip-switch to set the preenphasys at 50 or 75 µs. The preenphasys setting is relevant only for the Left and Right inputs in stereo mode and for the mono input in mono mode,

	while MPX input is unaffected by this setting.
[27] 19 kHz PILOT OUT	BNC output for the 19 kHz pilot tone. This can be used for external devices (e.g. RDS coders) synchronization.
[28] SCA2	BNC connector, SCA2 unbalanced input.
[29] SCA2 ADJ	Adjustment trimmer for SCA2 input.
[30] LEFT-MONO ADJ	Adjustment trimmer for Left-Mono channel input.
[31] LEFT-MONO	XLR connector, balanced Left-Mono channel input.
[32] IMPEDANCE	Dip-switch to set the balanced input impedance, 600Ω or 10kΩ.

4.5 Connectors Description

4.5.1 RS232

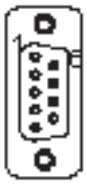
Type: Female DB9



1	NC
2	SDA
3	SCL
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

4.5.2 Service (**for programming of factory parameters**)

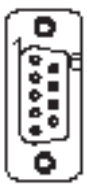
Type: Female DB9



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

4.5.3 I^2C Bus

Type: Male DB9



1	NC
2	TX_D
3	RX_D
4	Internally connected with 6
5	GND
6	Internally connected with 4
7	Internally connected with 8
8	Internally connected with 7
9	NC

4.5.4 Left (MONO) / Right

Type: Female XLR

1	GND
2	Positive
3	Negative

4.5.5 Remote

Type: Female DB15

Pin	Name	Type	Meaning
1	Interlock	IN	By passes power if closed at GND
2	Ext AGC FWD	IN	Ext. signal,1-12V, for power limitation (AGC)
3	GND		Ground
4	SDA IIC	I/O	IIC communication serial data
5	VPA Tlm	ANL OUT	PA power supply voltage 3,9V F.S.
6	FWD Tlm	ANL OUT	Forward power 3,9V F.S.
7	Power Good	DIG OUT	Open collector, enabled whenpower exceeds the set threshold
8	GND		Ground
9	GND		Ground
10	Ext AGC RFL	IN	Ext. signal.,1-12V, for power limitation (AGC)
11	SCL IIC	I/O	IIC communication clock
12	IPA Tlm	ANL OUT	PA power supply current 3,9V F.S.
13	RFL Tlm	ANL OUT	Reflected power 3,9V F.S.
14	On cmd	DIG IN	One grounded pulse (500 ms) enables power supply
15	OFF cmd	DIG IN	One grounded pulse (500 ms) disables power supply

4.6 Technical Description

Parameters	TEX30LCD	TEX50LCD	TEX100LCD	TEX150LCD	TEX300LCD	TEX502LCD	TEX702LCD
GENERALS							
Rated output power	30W	50W	100W	150W	300W	500W	700W
Frequency range	FCC -CCIR - OIRT - JPN						
Operational Mode	Mono, Stereo, Multiplex						
Modulation type	F3E						
Primary Power	80 ÷ 260 Vac or 24	115 / 230 ±15% or 28 Vdc			80 ÷ 260 Vac		
AC Power Consumption	130 VA / 70W	200 VA /100W	330 VA / 212 W	440 VA / 260 W	560 VA / 520 W	970VA / 940W	1280VA / 1240W
Phisical Dimensions (W x H x D)	483 x 88 x 394 mm						
Weight	7 kg	8,5 kg	8,5 kg	8,5 kg	9,5 kg	10 kg	10 kg
Environmental Working Conditions	-10 ÷ +50 °C / 95% relative Humidity non condensing						
Cooling	Forced, with internal fan						
Frequency programmability	From software, with 10 kHz steps						
Frequency stability	±1 ppm						
Pre-emphasis mode	0/50 (CCIR) µS, 75 (FCC) µS						
Spurious & harmonic suppression	<75 dBc (80 typical)						
Asynchronous AM S/N ratio	≥ 65 dB (typical 70)	≥ 60 dB (typical 68)			≥ 60 dB (typical 65)		
Synchronous AM S/N ratio	≥ 50 dB (typical 60)	≥ 50 dB (typical 58)			≥ 50 dB (typical 55)		
MONO OPERATION							
S/N FM Ratio	> 80 dB RMS (typical 85 dB)						
Frequency Response	< ± 0.5 dB 30Hz ÷ 15kHz (typical ± 0.2 dB)						
Total Harmonic Distortion	< 0.1 % 30 Hz ÷ 15 kHz (typical 0.07 %)						
Intermodulation distortion	< 0.02 % with 1 kHz and 1,3 kHz tones						
MPX OPERATION							
Composite S/N FM Ratio	> 80 dB RMS (typical 85 dB)						
Frequency Response	± 0.2 dB 30Hz ÷ 53kHz / ± 0.5 dB 53kHz ÷ 100 kHz						
Total Harmonic Distortion	< 0.1% 30Hz ÷ 53kHz						
Intermodulation distortion	< 0.05% with 1 kHz and 1,3 kHz tones						
INTERNAL STEREO CODER OPERATION							
Stereo S/N FM Ratio	> 75 dB RMS (typical 78dB)						
Frequency Response	± 0.5 dB 30 Hz ÷ 15 kHz						
Total Harmonic Distortion	< 0.05% 30 Hz ÷ 15 kHz						
Intermodulation distortion	≤ 0.03% with 1 kHz and 1,3 kHz tones						
Stereo separation	> 50 dB 30 Hz ÷ 15 kHz (typical 55 dB)						
AUDIO INPUT CONNECTORS							
Left / Right	XLR balanced; Impedance: 10 k or 600 ohm; Level: -13 to +13 dBu						
MPX unbalanced/RDS	BNC unbalanced; Impedance: 10 k or 50 ohm; Level: -13 to +13 dBu						
SCA/RDS	2 x BNC unbalanced; Impedance: 10 k; Level: -8 to +13 dBu						
OTHER CONNECTORS							
RF Output	N (50 ohm)						
RF Monitor	BNC (- 30dBr referred to RF output)						
Pilot output	BNC (1Vpp)						
Interlock Input	BNC						
STANDARD COMPLIANCE							
Safety	EN 60215:1989 EN60215/A1:1992-07 EN60215/A2:1994-09						
EMC	EN 301 489-1 V1.4.1 (2002-08) EN 301 489-11 V1.2.1 (2002-11)						
Radio	EN 302 018-2 V1.2.1 (2005-06)						

5. Quick guide for installation and use

This section provides a step-by-step description of equipment installation and configuration procedure. Follow these procedures closely upon first power-on and each time any change is made to general configuration, such as when a new transmission station is added or the equipment is replaced.

Once the desired configuration has been set up, no more settings are required for normal operation; at each power-up (even after an accidental shutdown), the equipment defaults to the parameters set during the initial configuration procedure.

The topics covered in this section are discussed at greater length in the next sections, with detailed descriptions of all hardware and firmware features and capabilities. Please see the relevant sections for additional details.

IMPORTANT: *When configuring and testing the transmitter in which the equipment is integrated, be sure to have the Final Test Table supplied with the equipment ready at hand throughout the whole procedure; the Final Test Table lists all operating parameters as set and tested at the factory.*

5.1 Prepation

5.1.1 Preliminary checks

Unpack the exciter and immediately inspect it for transport damage. Ensure that all connectors are in perfect condition.

The main fuse can be accessed from the outside on the rear panel. Extract the fuse carrier with a screwdriver to check its integrity or for replacement, if necessary. The fuse to be used is this type:

	Fusibile principale
TEX30LCD @ 90÷260 Vac	**(1x) 3.15A tipo 5x20**
TEX50/100/150LCD @ 230 Vac/115 Vac	**(1x) 6.3A tipo 5x20**
TEX300/502/702LCD @ 230 Vac/115 Vac	**(1x) 8A tipo 5x20**

Table 5.1: ***Fuses***

Provide for the following (applicable to operating tests and putting into service):

√ Single-phase 230 VAC or 115 VAC (-15% / +10%) mains power supply for **TEX50/100/150LCD**, or 80÷260 VAC full-range mains power supply for **TEX30/300/502/702LCD**, with adequate earth connection.

√ For operating tests only: dummy load with 50 Ohm impedance and adequate

capacity (30W for **TEX30LCD,** 50W for **TEX50LCD,** 100W for **TEX100LCD,** 150W for **TEX150LCD,** 300W for **TEX300LCD,** 500W for **TEX502LCD** or 700W for **TEX702LCD** as a minimum).

√ Connection cable kit including:

- Mains power cable
- Coaxial cable with BNC connectors for interlock signal connection
- RF cable for output to load / antenna (50 Ohm coaxial cable with N-type connector)
- Audio cables between transmitter and audio sources.

5.1.2 Connections

Connect the RF output of the transmitter to the antenna cable or a dummy load capable of dissipating amplifier output power. To begin with, set exciter to minimum output power and switch it off.

Connect the transmitter INTERLOCK IN input to the matching INTERLOCK OUT output fitted on R.V.R. Elettronica equipment to act as hybrid couplers. If your equipment is a different brand, identify an equivalent output.

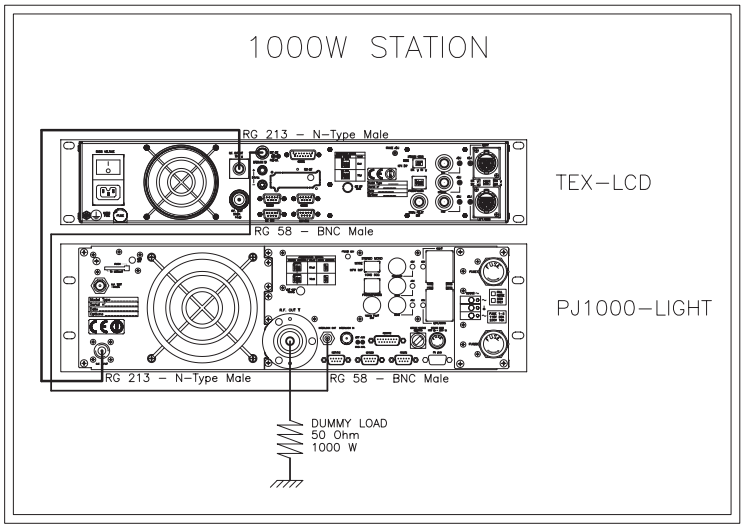


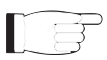
Figure 5.2: ***connections with amplifier***

WARNING: Electric shock hazard! Never handle the RF output connector when the equipment is powered on and no load is connected. Injury or death may result.

Ensure that the POWER switch on the front panel of **TEX30/50/100/150/300/502/702LCD** is set to "**OFF**".

The exciter has two switches: one is embedded in VDE socket for mains power cord and interrupts all mains power supply of the machine, while the second is on the front panel and acts by inhibiting the switching power supply of the machine.

Connect the mains power cable to the MAINS connector on the rear panel.



Note: *the mains must be equipped with adequate earth connection properly connected to the equipment. This is a pre-requisite for ensuring operator safety and correct operation.*

Connect the audio and RDS/SCA signals from user's sources to the transmitter input connectors.

5.2 First power-on and setup

Seguire le istruzioni riportate di seguito nel caso di prima accensione o dopo aver effettuato un cambiamento alla configurazione dell'eccitatore nel quale questo componente è integrato.

Note : *Standard factory settings are RF output power off (**Pwr OFF**) and regulated output power set to upper limit (unless otherwise specified by customer).*

5.2.1 Power-on

When you have performed all of the connections described in the previous paragraph, power on the exciter using the suitable power switch on the front panel.

5.2.2 Power check

Ensure that the **ON** LED turns on. Equipment name should appear briefly on the display, followed by forward power and modulation readings. If the RF output is disabled, those readings will be zero.

When the PLL locks to operating frequency, the LOCK LED will turn on.

5.2.3 How to enable the RF output

Check output power level and set it to maximum level (unless it has already been set) from the Power Setup menu that you will have accessed by pressing the following sequence of key: ESC (opens Default Menu) ⇒ ENTER (hold down for 2 seconds) ⇒ SET ⇒ use keys to set bar to upper limit (figure 5.2 - menu 2).

Check the state of the **Pwr** output power by the **Fnc** menu. If it is set to **OFF**, press **ENTER** to bring the selection to **ON**.

5.2.4 Controllo del livello di potenza di uscita

Note: *The exciter incorporates Automatic Gain Control (AGC) and output power is modulated based on the power level set by the user and actual operating conditions, such as temperature, reflected power and other parameters. Please read section 5.3 for more details of RF power modulation.*

Access the **Power Setup Menu** pressing the following keys in the order:

ESC (opens **Default Menu**) ⇒ **ENTER** (hold down for 2 seconds)

Use the keys and in the **SET** menu to set exciter output power; the setting bar at the side of **SET** provides a graphic indication of power setting; please consider that the forward power readout provided on the display (**FWD: xxxx W**) reflects actual output power reading, **which may be lower than regulated power supply when Automatic Gain Control is running in power supply limitation mode** (please read section 5.3 about RF power supply modulation for more details).

Note: *Output power may be set using the* **Pwr OFF** *control. In this condition, the output power readout (***Fwd***) on the display will read 0 (zero); the* **SET** *bar will reflect any adjustments you make using the keys and provides a graphic indication of how much power supply will be delivered the moment you return to* **Pwr On** *state.*

5.2.5 Changing the *Power Good* alarm threshold

Change Forward Power Good alarm setting **PgD** from the **Fnc** menu as desired (factory setting is 50%).

5.2.6 Setting equipment I^2C address

Change the **IIC** address in the **MIX** (Miscellaneous) menu as desired (factory setting is 01).

5.2.7 Adjustments and calibration

The only manual adjustments are the level adjustments and the audio mode adjustment.

The rear panel holds the trimmers for all exciter inputs. Trimmer identification is printed on the rear panel. Input sensitivity can be set within the limits set out in the tables below through the trimmers:

Input sensitivity:

Input	Figure 6.2	Trimmer	Sensitivity	Notes
SCA1/ RDS	[13]	[16]	- 8 ÷ +13 dBu	Input level for 7,5 kHz overall deviation (- 20 dB)
SCA2	[28]	[29]	- 8 ÷ +13 dBu	
MPX	[14]	[15]	-13 ÷ +13 dBu	Input level for 75 kHz overall deviation (0 dB)
Left/ Mono	[31]	[30]	-13 ÷ +13 dBu	
Right	[18]	[17]	-13 ÷ +13 dBu	

When setting input sensitivity, please consider that the default menu reports instantaneous modulation level and an indicator provides a 75 kHz reading. To ensure correct adjustment, apply a signal with the same level as user's audio broadcast maximum level and then adjust using the trimmer until instantaneous deviation matches the 75 kHz reading.

To set subcarrier input levels, you may use the same procedure and option "x10" available in the **Fnc** menu. With this option, modulation level is multiplied by a factor of 10, which means that default menu bar meter reflects a 7.5 kHz deviation.

A special menu with separate indications of Left and Right channel levels and relating indicators of nominal levels for maximum deviation (75 kHz) is provided.

- Preemphasis:

50 µs

75 µs

- L and R (XLR type) input impedance:

Switch 1: R XLR input impedance, ON = 600 Ω, OFF = 10 kΩ

Switch 2: L XLR input impedance, ON = 600 Ω, OFF = 10 kΩ

- MPX input operation mode/impedance:

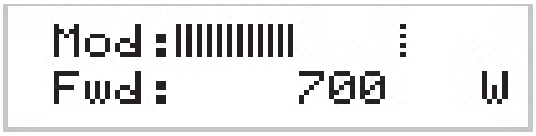
Switch 1: Mode of operation ON = Mono, OFF = Stereo

Switch 2: MPX input impedance, ON = 50 Ω, OFF = 10 kΩ

5.3 Operation

NOTE: For better clarity, only the typical screens of **TEX702LCD** are reported below. **TEX30/50/100/150/300/502LCD** screens look the same except that full scale values are different.

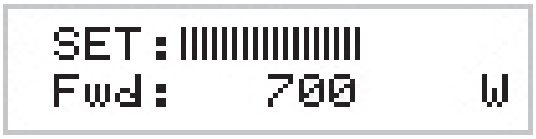
1) Power on the exciter and ensure that the **ON** light turns on. Equipment name should appear briefly on the display, quickly followed by modulation and forward power readings (Menu 1), provided that the exciter is delivering output power.



Menu 1

1b) To **modify power level setting**, hold down the **ENTER** button until opening the **power setup menu**.

The edit screen will look like this:



Menu 2

Next to **SET** indication, a bar provides a graphic display of preset output power. The filled portion of the bar is proportional to set power level.

Example		
100% potenza di uscita	**Barra piena**	**≅ 700W in uscita (mod.TEX702LCD)** **≅ 500W in uscita (mod.TEX502LCD)** **≅ 300W in uscita (mod.TEX300LCD)** **≅ 150W in uscita (mod.TEX150LCD)** **≅ 100W in uscita (mod.TEX100LCD)** **≅ 50W in uscita (mod.TEX50LCD)** **≅ 30W in uscita (mod.TEX30LCD)**
25% potenza di uscita	**1/4 della barra**	**≅ 175W in uscita (mod.TEX702LCD)** **≅ 125W in uscita (mod.TEX502LCD)** **≅ 75W in uscita (mod.TEX300LCD)** **≅ 700W in uscita (mod.TEX702LCD)** **≅ 37,5W in uscita (mod.TEX150LCD)** **≅ 25W in uscita (mod.TEX100LCD)** **≅ 12,5W in uscita (mod.TEX50LCD)** **≅ 7,5W in uscita (mod.TEX30LCD)**

The bottom line provides instantaneous power reading (700W for **TEX702LCD** shown here), press button ↓ to increase level, press ↵ to decrease it. When you have achieved the desired level, press **ENTER** to confirm and exit the **default menu**. Please note that the setting is stored automatically; in other words, if you press ESC or do not press any keys before the preset time times out, the latest power level set will be retained.

NOTE: This feature prevents the equipment from delivering maximum power as soon as output is enabled from menu 4, or in the event the equipment is already set to **ON** when you energise it.

2) Ensure that the equipment is not in a locked-out state. Press **ESC** to call up the selection screen (menu 3). Highlight **Fnc** and press **ENTER** to confirm and access the selected menu (menu 4).

   If **PWR** is set to OFF, i.e. power output is disabled, move cursor to **PWR**. Press **ENTER** and label will switch to ON, i.e. power output is enabled.

   Press **ESC** twice to go back to the default menu (menu 1).

3) Fine tune power setting from menu 2 (see description of item 1b) until achieving the desired value.

WARNING: Equipment is capable of delivering more than rated output power (30/50/100/150/300/500/700 W for **TEX30/50/100/150/300/502/702LCD** respectively); however, never exceed the specified power rating.

NOTE: If power is set to 0 W in the **Power Setup Menu**, the INTERLOCK OUT contact is activated and any external appliances connected to it are immediately inhibited.

Next, you can review all operating parameters of the equipment through the management firmware.

Normally, the equipment can run unattended. Any alarm condition is handled automatically by the safety system or is signalled by the LED indicators on the panel or by display messages.

NOTE: Standard factory settings are output power set to upper limit (unless otherwise specified by customer) and **OFF**.

5.4 Management Firmware

The equipment features an LCD with two lines by 16 characters that displays a set of menus. The figure below provides an overview of equipment menus.

The symbols listed below appear in the left portion of the display as appropriate:

_ (Cursor) - Highlights selected (i.e. accessible) menu.

▶ (Filled arrow) - Editable parameter marker. This symbol appears in menus that take up more than two lines to aid browsing.

▷▷▷ (Three empty arrows) - Parameter is being edited.

▷ (Empty arrow) - Current line marker; the parameter in this line cannot be edited. This symbol appears in menus that take up more than two lines to aid browsing.

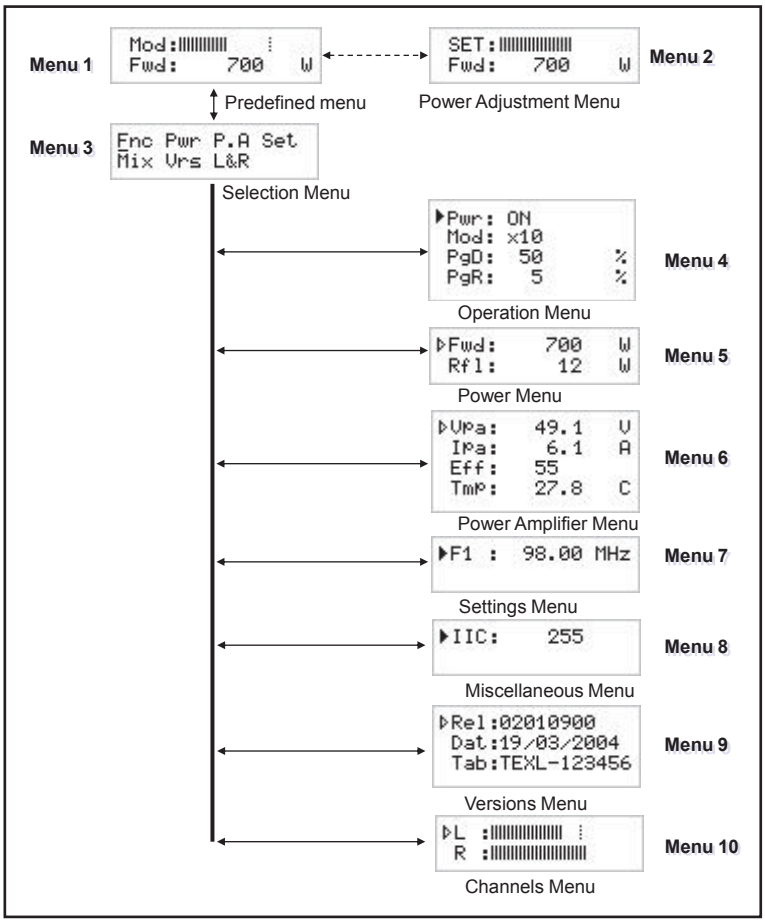


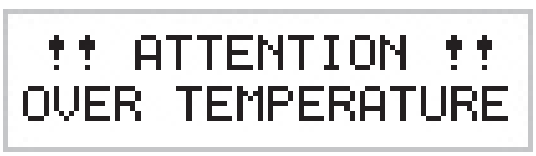
Figure 5.2

When the display is off, touching any key will turn on backlighting.

When the display is on, pressing the **ESC** button from the **default menu** (menu 1) calls up the **selection screen** (menu 3), which gives access to all other menus:

Menù 3

If the temperature alarm is enabled and the alarm threshold is exceeded, the following screen will be displayed (only if you are in the default screen):



As soon as operating conditions are restored, power output is re-enabled with the same settings in use prior to the alarm condition.

Under 20kHz, no modulation occurs. After a preset time of about 5 minutes (not editable), a NO AUDIO condition is indicated in the main screen, but power is not inhibited.

State 2

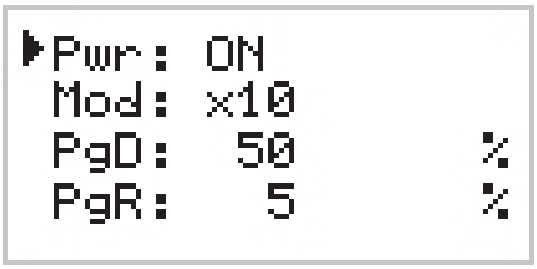
To gain access to a submenu, select menu name (name is highlighted by cursor) using button or and press the **ENTER** button.

To return to the **default menu** (menu 1), simply press **ESC** again.

5.4.1 Operation Menu (Fnc)

In this menu, you can toggle exciter **power output** On/Off, set **deviation display mode** and the threshold rate for **Forward** (**PgD**) or **Reflected** (**PgR**) **Power Good**.

To edit an item, highlight the appropriate line using the ↵ and ↓ buttons and then press and hold the **ENTER** button until the command is accepted. This way, Pwr setting is toggled between On and Off and Mod setting is toggled between “x1” and “x10”. To edit the Power Good rate, simply select item “PgD” or “PgR” and edit its value using the UP and DOWN buttons; finally, press ENTER to confirm.



Menu 4

`Pwr` Enables (ON) or disables (OFF) exciter power output.

`Mod` Modifies modulation display (toggles between “x1” and “x10”). In “x10” mode, instantaneous deviation indication is multiplied by a factor of 10, and the bar meter on the default menu will reflect 7.5 kHz instead of

75 kHz. This display mode is convenient when you wish to display low deviation levels, such as those caused by pilot tone or subcarriers.

`PgD` Modifies Power Good threshold for forward power. The Power Good rate is a percent of equipment rated power (30/50/100/150/300/500/702 W for **TEX30/50/100/150/300/502/702LCD** respectevely), not of forward output power. This means that this threshold set at 50% will give 15/25/50/75/150/250/350 W, respectively, regardless of set power level. The Power Good feature enables output power control and reporting. When output power drops below set Power Good threshold, the equipment changes the state of pin [7] of the DB15 “Remote” connector located on the rear panel.

`PgR` Modifies Power Good threshold for reflected power. The Power Good rate is a percent of equipment rated power (3/5/10/15/30/50/70 W for **TEX30/50/100/150/300/502/702LCD** respectevely), not of reflected output power. This means that this threshold set at 5% will give 0,15 /0,25/0,50/0,75/1,5/2,5/3,5 W , respectively, regardless of set power level. The Power Good feature enables output power control and alarm management.

NOTE: This alarm does not trip any contacts in the DB15 “Remote” connector and is only available in systems equipped with telemetry.

5.4.2 Power menu(Pwr)

This screen holds all readings related to equipment output power:

Menu 5

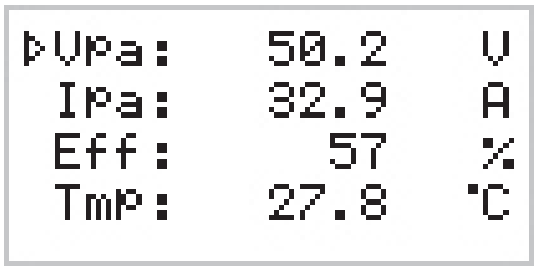
`Fwd` Forward power reading.

`Rfl` Reflected power reading.

Note that these are readings, rather than settings, and cannot be edited (note the empty triangle). To change power setting, go to the **default menu** as outlined earlier.

5.4.3 Power Amplifier (P.A) Menu

This screen is made up of four lines that can be scrolled using the and buttons and shows the readings relating to final power stage:



Menu 6

Note that these are readings, rather than settings, and cannot be edited (note the empty arrow).

`VPA` Voltage supplied by amplifier module.

`IPA` Current draw of amplifier module.

`Eff` Efficiency based on ratio of forward power to amplifier module power, in percent (FWD PWR/(Vpa x Ipa) %).

`Tmp` Equipment internal temperature reading.

5.4.4 Setup Menu (Set)

This menu lets you view and set operating frequency.

Menu 7

`F1` Operating frequency setup. Set a new frequency value and then press the **ENTER** button to confirm your selection; the exciter unlocks from current frequency (the **LOCK** LED turns off) and will lock to the new operating frequency (**LOCK** turns back on again).
If you press **ESC** or let the preset time time out, the previous frequency setting is retained.

5.4.5 Miscellaneous Menu (Mix)

This menu lets you set equipment address in an I²C bus serial connection:

Menu 8

`IIC` I²C address setting. The I2C network address becomes significant when the exciter is connected in an RVR transmission system that uses this protocol. Do not change it unless strictly required.

5.4.6 Version Menu (Vrs)

This screen holds equipment version/release information:

Menu 9

Note that these are readings, rather than settings, and cannot be edited (note the empty arrow).

`Rel` Firmware release information.

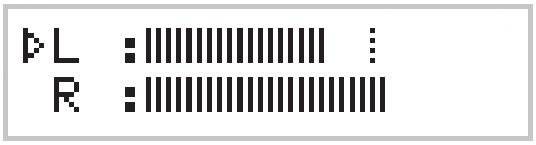
`Dat` Release date.

`Tab` Shows table loaded in the memory.

5.4.7 Channels Menu (L&R)

Right and left channel input levels are displayed as horizontal bars as shown in the figure below.

The bar meter reflects the level corresponding to a 100% deviation for each channel and provides a convenient reference when setting audio channel input levels.



Menù 10

`L` Left channel Vmeter.

`R` Right channel Vmeter..

5.5 Optional Function

A range of options is available for the product to add certain functions and/or modify existing functions. Outlined below are the functions available at the moment, which must be specified on order.

5.5.1 FSK Option

The FSK function generates periodic carrier frequency shifts to generate a Morsecoded station ID code.

NOTE: ***This function is typically used in the USA.***

The factory setting for frequency shift is +10KHz and code repetition period is 60 minutes (please contact R.V.R. Elettronica if you need different settings), whereas station identified may be programmed by the user following the indications provided in section below.

When the FSK option is fitted, an FSK submenu is added to the **selection menu**.

Menu 11

Press the **ENTER** key when FSK is highlighted in the **selection menu** to access the FSK submenu:

Menu 12

`FSK` Enables / disables FSK code transmission.

`Cod` Shows the Morse code sent normally.

5.5.1.1 Changing the ID code

User may change the FSK code used as a station identifier at any time.

This procedure requires:

- 1 RS232 male-female cable;
- Hyper Terminal interface (make sure it has been installed together with Windows®) or equivalent serial communication software.

A brief description of the procedure is provided below:

- Connect the PC serial port COM to the SERVICE connector on the rear panel of **TEX30/50/100/150/300/502/702LCD** using a standard Male DB9 - Female DB9 serial cable.
- Power on the exciter;
- Launch the serial communication software;
- Set communication parameters as follows:

  Baud Rate: 19200

  Data Bit: 8

  Parity: None

  Stop Bit: 1

  Flow control: None;
- Activate Caps-Lock through the communication software and send string CODE followed by the 6-character station ID code followed by Enter.

NOTE: To be treated as valid, the code must be made up of 6 alphanumeric characters and must contain no blank spaces; if acknowledged as valid, code is echoed back to the terminal, illegal codes are not echoed.

5.5.2 Power UP/DOWN Option

The Power UP/DOWN option modifies the signal receive function for the signals present at the telemetry connector.

RF section on / off control signals are treated as control signals for RF output power level to allow for UP/DOWN setting.

The UP or DOWN command is provided by switching the corresponding signal at the connector to ground for at least 500mS (pin features internal pull-up to power supply).

Configuration of DB15F telemetry connector (Remote):

Pin	Standard Function	UP/DOWN Power Function
14	On cmd	Up cmd
	Enables the RF power supply	*Increases the RF power supply*
15	Off cmd	Down cmd
	Disables the RF power supply	*Reduces the RF power supply*

6. Identification and Access to the Modules

6.1 Identification of the Modules

The **TEX30/50/100/150/300/502/702LCD** is made up of various modules linked to each other through connectors so as to make maintenance and any required module replacement easier.

6.1.1 TEX30LCD Upper view

The figure below shows the equipment upper view with the various components pointed out.

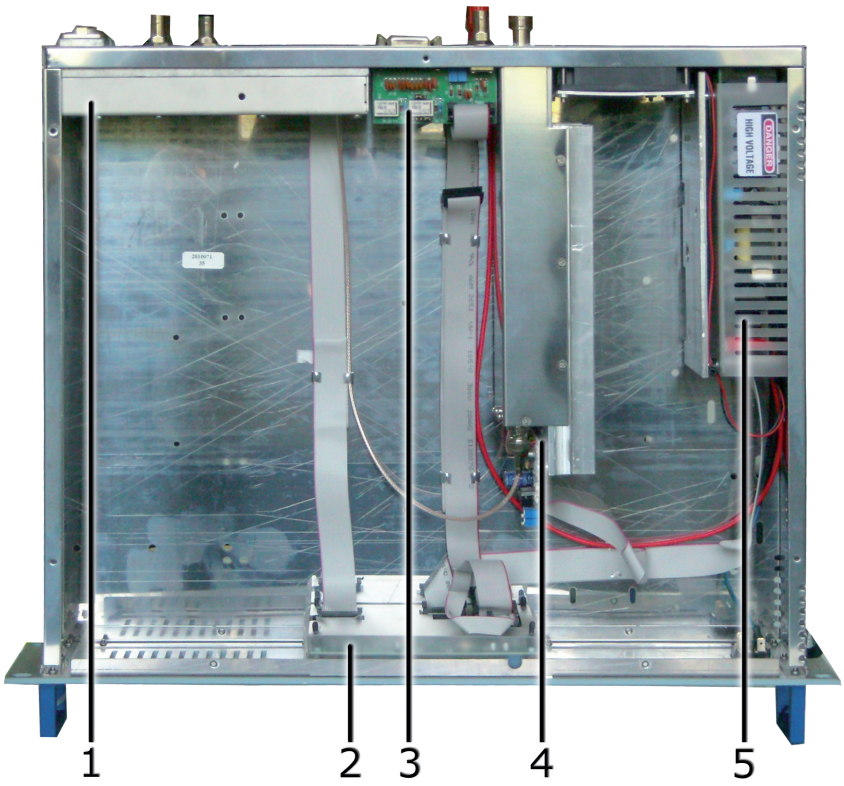


figure 8.1

[1] Main Board & Stereo Coder Card (**SLMBDTEXLC07** & **SLCTC30V03**)
[2] Panel Card (**SL007PC3001**)
[3] Telemetry Card *(***SLTLMTXLCD03***)*
[4] Control Card& Power Amplifier (**SL037BI1004** & **SLPA30WMOS02**)
[5] Power Supply (**FLY100SMD**)

6.1.2 TEX50/100/150LCD Upper view

The figure below shows the equipment upper view with the various components pointed out.

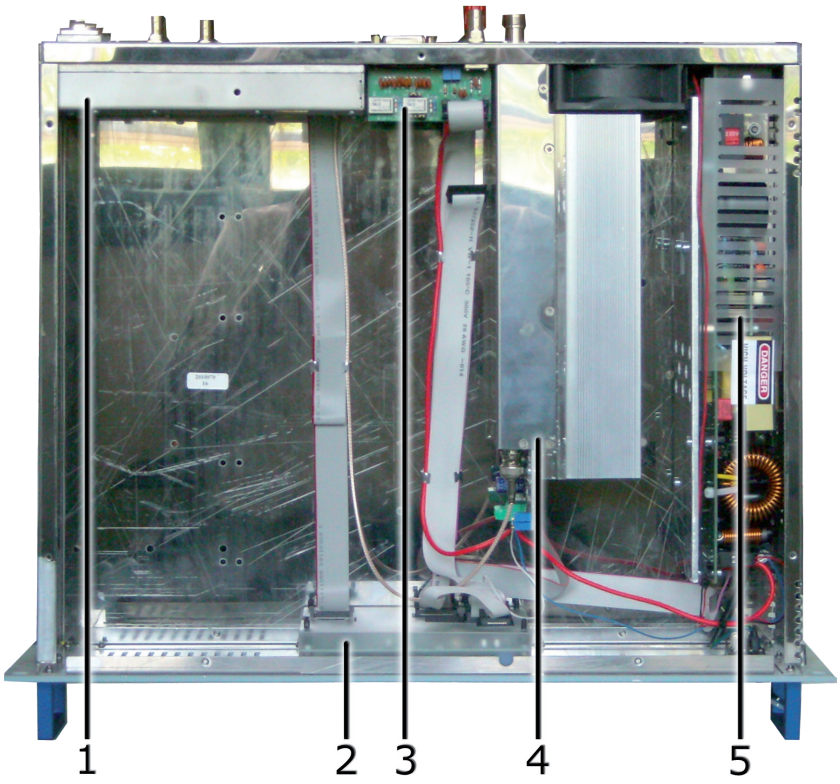


figure 8.2

[1] Main Board & Stereo Coder Card (**SLMBDTEXLC07** & **SLCTC30V03**)
[2] Panel Card (**SL007PC3001**)
[3] Telemetry Card *(***SLTLMTXLCD03***)*
[4] Control Card& Power Amplifier (**SL045DR1003** & **SLPA150WMOS**)
[5] Power Supply (**PSL300**)

6.1.3 TEX300LCD Upper view

The figure below shows the equipment upper view with the various components pointed out.

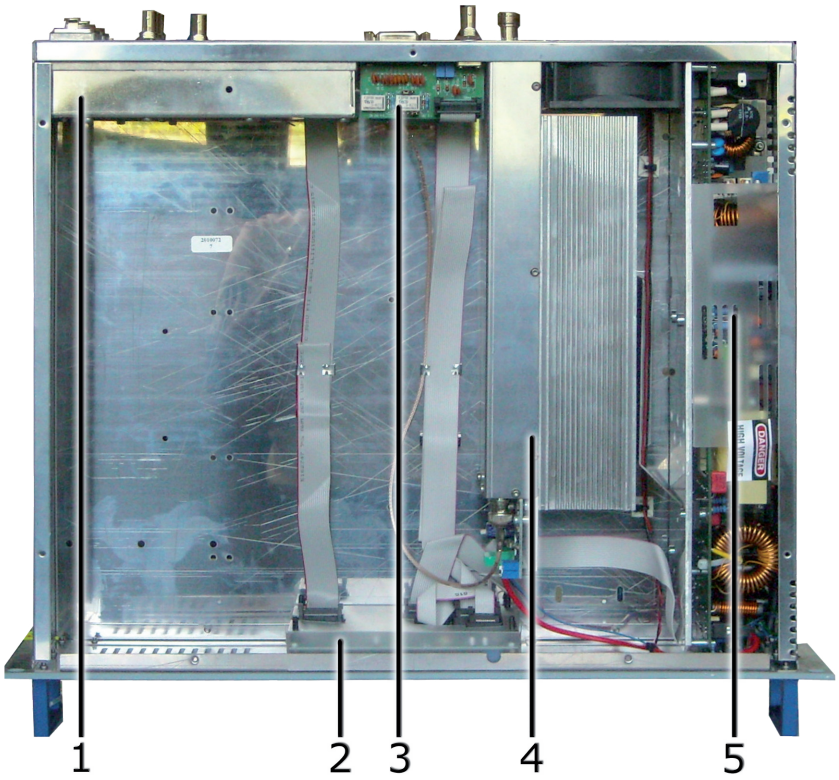


figure 8.3

[1] Main Board & Stereo Coder Card (**SLMBDTEXLC07** & **SLCTC30V03**)
[2] Panel Card (**SL007PC3001**)
[3] Telemetry Card *(***SLTLMTXLCD03***)*
[4] Control Card& Power Amplifier (**SL045DR1003** & **SL045RF1002**)
[5] Power Supply (**PSL600**)

6.1.4 TEX502/702LCD Upper view

The figure below shows the equipment upper view with the various components pointed out.

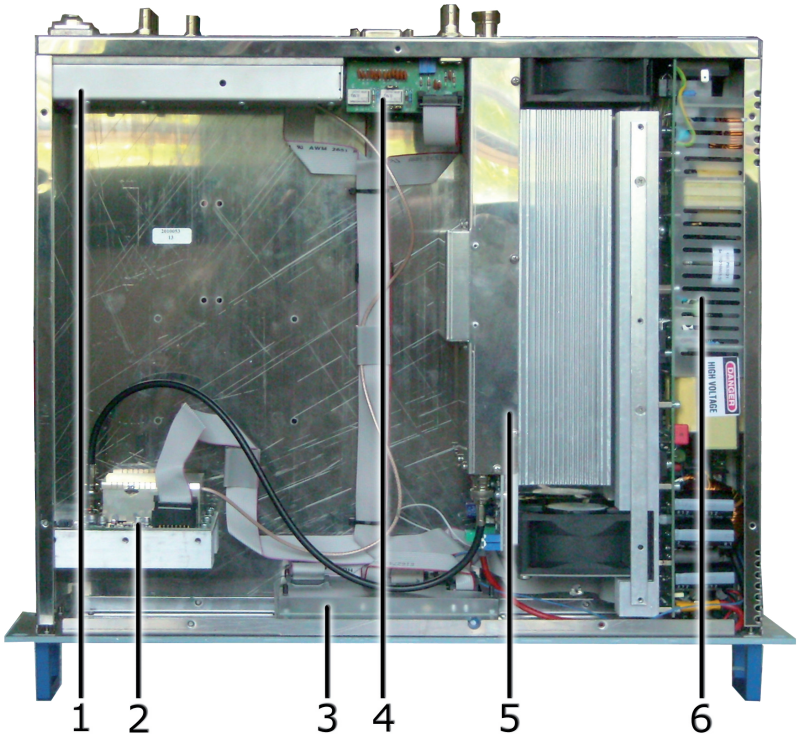


figure 8.4

[1] Main Board & Stereo Coder Card (**SLMBDTEXLC07** & **SLCTC30V03**)
[2] Driver Card (**SL175DR1002**)
[3] Panel Card (**SL007PC3001**)
[4] Telemetry Card *(***SLTLMTXLCD03***)*
[5] Bias Card, Control Card, Low Pass Filter Card & Power Amplifier - **TEX502LCD** model (**SL046BI1001**, **SL175BI1001**, **SL175LP1002** & **SL154RF3001**)
Bias Card, Cintrol Card, Low Pass Filter Card & Power Amplifier - **TEX702LCD** model (**SL046BI1001**, **SL175BI1001**, **SL175LP1002** & **SL154RF2002**)
[6] Power Supply (**PSL5021**)

7. Working Principles

7.1 TEX30/50/100/150/300/502/702LCD Common Parts

7.1.1 Panel board

The panel board contains the microcontroller (PIC18F452) that implements the equipment control software, the display and the other components needed to interface with the user.

The board is connected with the other machine modules, both for power supply distribution and for the control and measures.

7.1.2 Main board

The main board carries out the following functions:

- Audio and SCA input treatment
- Generation of carrier frequency
- Modulation
- R.F. amplification (Driver)

The board also features a stereophonic coder.

7.1.2.1 Audio input section

The audio input section contains the circuits that perform the following functions:

- Input impedance selection
- 15 kHz filtering of the left and right channel
- Stereophonic Coding
- Mono channel preemphasis
- Mono, MPX and SCA channel mixing
- Clipper (limits the modulating signal level so that the frequency deviation does not exceed 75 kHz)
- Modulating signal measurement

7.1.2.2 PLL/VCO section

This board section generates the modulated radiofrequency signal. It is based on a PLL scheme that uses an integrated MB15E06 type.

7.1.2.3 Driver section

Before passing to the final power amplifier, the RF signal is preamplified in this

section by an ERA3 transistor. When the exciter is placed on stand-by, the driver is by-passed.

7.1.3 Telemetry board

This board is designed to inform the user of the equipment operation state. All input and output signals are available on the DB15 connector.

The same board also features the “INTERLOCK” BNC connector for disabling the device. By grounding the central pin, the output power is reduced to zero until the connection is removed.

When an R.V.R. amplifier is used, this connector is linked to the power amplifier REMOTE or INTERLOCK by means of a BNC-BNC connection. In case of amplifier faults, the central conductor is grounded thus forcing the machine to enter in stand-by mode.

7.2 TEX30LCD Different Parts

7.2.1 Power Supply

The **TEX30LCD** power supply unit is a switching-type unit whose +28 V main output powers the machineÌs RF amplifier. The power supply also features stabilizers for generating continuous +5 V and +18 V voltages for supplying the other equipment circuits. Note that the power supply is a “direct from mains” type, or rather it is without a transformer, and it can be connected to any voltage between 80 and 260 V without any adjustments or manual settings. The power supply unit is also connected to 24 V auxiliary continuous voltage inputs used to automatically buffer the mains power cutoff.

7.2.2 Power Amplifier

The final power stage is enclosed in a totally shielded metal container fastened in the centre of the device.

The RF signal coming from the “main” card reaches the pilot, is amplified and is then sent to the final stage that sees to its final amplifications up to 30W.

The amplifier is made in three stages. The first is made with one BFG35, the secondwith three BFG35 in parallel, and the last with one BLF245.

In addition to the actual RF amplification, this circuit carries out the following functions:

- Control of the power level in output, depending on the setting
- Reduction of the power supplied when in presence of high-level reflected power

- Measures of the forward and reflected power by means of directional couplers
- Measures of the current absorbed by the power amplifier
- Measures of the temperature
- Low-pass filtering of the RF signal in output

This board also features an RF sampling of approximately -30dB RF with respect to the output, which is available on a BNC connector below the transmitter output connector. This sample is is useful for verifying the characteristics of the carrier, but not for verifying those of the upper harmonics.

7.2.3 Control Board

The main function of this board is to check and correct the MOSFET polarization voltage of the RF amplifier section.

It also provides the measurement of the absorbed current and contains a circuit for signaling power supply unit faults.

If no alarms are present, the voltage is adjusted only depending on the set output power, with a feedback mechanism based on the reading of the power really delivered (AGC).

The voltage is also affected by other factors, such as:

- Excess of reflected power.
- External AGC signals (Ext. AGC FWD, Ext. AGC RFL).
- Excess of temperature.
- Excess of absorbed current from the RF module.

7.3 TEX50/100/150LCD Different Parts

7.3.1 Power Supply

The **TEX50/100/150LCD** power supply unit is a switching-type unit whose +28 V main output powers the machineÌs RF amplifier. The power supply also features stabilizers for generating continuous +5 V, -15V, +8V, +18 V and -18 V voltages for powering the other device circuits. The power supply unit is also connected to 24 V auxiliary continuous voltage inputs used to automatically buffer the mains power cutoff.

7.3.2 Power Amplifier

The final power stage is enclosed in a totally shielded metal container fastened in the centre of the device.

The RF signal coming from the “main” card reaches the pilot, is amplified and is then sent to the final stage that sees to its final amplifications up to 150W.

The amplifier is made in two stages. The first is made with BLF244 and the last with BLF147.

In addition to the actual RF amplification, this circuit carries out the following functions:

- Control of the power level in output, depending on the setting
- Reduction of the power supplied when in presence of high-level reflected power
- Measures of the forward and reflected power by means of directional couplers
- Measures of the current absorbed by the power amplifier
- Measures of the temperature
- Low-pass filtering of the RF signal in output

On this card is an RF sample approximately -30dB compared with the output that is available on a BNC connector underneath the output connector of the transmitter. This sample is useful for checking the characteristics of the carrier, but not of the higher order harmonics.

7.3.3 Control Board

The main function of this board is to check and correct the MOSFET polarization voltage of the RF amplifier section.

It also provides the measurement of the absorbed current and contains a circuit for signaling power supply unit faults.

If no alarms are present, the voltage is adjusted only depending on the set output power, with a feedback mechanism based on the reading of the power really delivered (AGC).

The voltage is also affected by other factors, such as:

- Excess of reflected power.
- External AGC signals (Ext. AGC FWD, Ext. AGC RFL).
- Excess of temperature.
- Excess of absorbed current from the RF module.

7.4 TEX300LCD Different Parts

7.4.1 Power Supply

The **TEX300LCD** power supply unit is a switching-type unit whose +50 V main stabilizers for generating continuous +5 V, +18 V and -18 V voltages for supplying the other equipment circuits. Note that the power supply is a “direct from mains” type, or rather it is without a transformer, and it can be connected to any voltage between 90 and 260 V without any adjustments or manual settings.

7.4.2 Power Amplifier

The final power stage is enclosed in a totally shielded metal container fastened in the centre of the device.

The RF signal coming from the “main” card reaches the pilot, is amplified and is then sent to the final stage that sees to its final amplifications up to 300W.

The amplifier is made in three stages. The first is made with BFG35, the second with one BLF175 and the last with one SD2942.

In addition to the actual RF amplification, this circuit carries out the following functions:

- Control of the power level in output, depending on the setting
- Reduction of the power supplied when in presence of high-level reflected power
- Measures of the forward and reflected power by means of directional couplers
- Measures of the current absorbed by the power amplifier
- Measures of the temperature
- Low-pass filtering of the RF signal in output

This board also features an RF sampling of approximately -60dB RF with respect to the output, which is available on a BNC connector below the transmitter output connector. This sample is is useful for verifying the characteristics of the carrier, but not for verifying those of the upper harmonics.

7.4.3 Control Board

The main function of this board is to check and correct the MOSFET polarization voltage of the RF amplifier section.

It also provides the measurement of the absorbed current and contains a circuit for signaling power supply unit faults.

power, with a feedback mechanism based on the reading of the power really delivered (AGC).

The voltage is also affected by other factors, such as:

- Excess of reflected power.
- External AGC signals (Ext. AGC FWD, Ext. AGC RFL).
- Excess of temperature.
- Excess of absorbed current from the RF module.

7.5 TEX502/702LCD Different Parts

7.5.1 Power Supply

The **TEX502LCD** power supply unit is a switching-type unit whose +50 V main stabilizers for generating continuous +5 V, +18 V and -18 V voltages for supplying the other equipment circuits. Note that the power supply is a “direct from mains” type, or rather it is without a transformer, and it can be connected to any voltage between 90 and 260 V without any adjustments or manual settings.

7.5.2 Power Amplifier

The final power stage is enclosed in a totally shielded metal container fastened in the centre of the device.

The RF signal coming from the “main” card reaches the pilot, is amplified and is then sent to the final stage that sees to its final amplifications up to 500W (for **TEX502LCD** model) or up to 700W (for **TEX702LCD** model).

The amplification stage consists of two main blocks.

In addition to the actual RF amplification, this circuit carries out the following functions:

- Control of the power level in output, depending on the setting
- Reduction of the power supplied when in presence of high-level reflected power
- Measures of the current absorbed by the power amplifier
- Measures of the temperature

This board also features an RF sampling of approximately -60dB RF with respect to the output, which is available on a BNC connector below the transmitter output connector. This sample is is useful for verifying the characteristics of the carrier, but not for verifying those of the upper harmonics.

7.5.2.1 Driver Stage block

The driver card is able to The card and drivers' capable of delivering approximately 15W of power.

The driver stage is made in two stages. The first is made with one BFG35 and the last with one LD-MOS PD57006.

7.5.2.2 Final Stage block

The final stage is made of two MOS-FET SD2932 (for **TEX502LCD** model) or two MOS-FET SD2942 (for **TEX702LCD** model).

7.5.3 Control Board

The main function of this board is to check and correct the MOSFET polarization voltage of the RF amplifier section.

It also provides the measurement of the absorbed current and contains a circuit for signaling power supply unit faults.

If no alarms are present, the voltage is adjusted only depending on the set output power, with a feedback mechanism based on the reading of the power really delivered (AGC).

The voltage is also affected by other factors, such as:

- Excess of reflected power.
- External AGC signals (Ext. AGC FWD, Ext. AGC RFL).
- Excess of temperature.
- Excess of absorbed current from the RF module.

7.5.4 Low Pass Filter Card

This card provide the low-pass filtering of the RF signal in output and measure the reflected and forward power output.

7.5.5 Bias Card

This card controls the bias voltage and contains AGC networks for forward power, reflected power, temperature, current and EXT AGC.

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Jimmie Joynt
Tel: 972-473-2577 | Email: jjsbp@msn.com

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